

PATENT COOPERATION TREATY

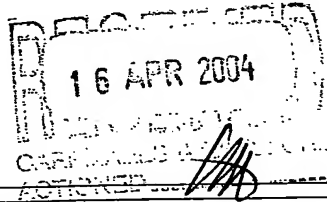
01 OCT 2004

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

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NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year)

13.04.2004

Applicant's or agent's file reference

P030328WO *PFO156*

IMPORTANT NOTIFICATION

International application No.
PCT/GB 03/01170

International filing date (day/month/year)
19.03.2003

Priority date (day/month/year)
12.04.2002

Applicant

DUPONT TEIJIN FILMS U.S. LIMITED PARTNERSHIP et al

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

*please disregard the original IPER dated 9-3-04.
Please find herewith a new IPER + amended claims.*

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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 14 APR 2004

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01 OCT 2004

Applicant's or agent's file reference P030328WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/GB 03/01170	International filing date (day/month/year) 19.03.2003	Priority date (day/month/year) 12.04.2002
International Patent Classification (IPC) or both national classification and IPC C09D183/04		
Applicant DUPONT TEIJIN FILMS U.S. LIMITED PARTNERSHIP et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 22.09.2003	Date of completion of this report 13.04.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Buestrich, R Telephone No. +49 89 2399-7473. 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/01170**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-31 as originally filed

Claims, Numbers

1-26 received on 27.01.2004 with letter of 23.01.2004

Drawings, Sheets

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-26
	No: Claims	
Inventive step (IS)	Yes: Claims	1-26
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-26
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB03/01170

Re item V:

Reasoned statement with regard to novelty and inventive step and industrial applicability, Article 33(1) to (4) PCT:

D1: US3986997

D2: US4177315

1. The subject-matter of present claims 1 to 26 is novel in the sense of Art.33(2) PCT.

D1 discloses a coating composition comprising

- (a) 10-50 wt% solids, comprising
 - 10-70 wt% silica and
 - 90-30 wt% of a partially polymerized organic silanole $\text{RSi}(\text{OH})_3$, wherein R is selected from vinyl, gamma-glycidoxypyrpyl and gamma-methacryloxypropyl (see D1, claim 1), and
- (b) 90-50 wt% solvent (D1, claim 1), the solvent comprising
 - 25-80 wt% water and
 - 20-75 wt% lower aliphatic alcohol (D1, claim 2),

wherein the coating composition has a pH from 3.0 to 6.0.

The application differs from D1 in that it claims (=claim 1 of the application) the **use of** a similar coating composition for the purpose of improving the surface smoothness of a polymeric substrate, wherein the surface of said coated substrate exhibits an Ra value of less than 0.6 nm, and/or an Rq value of less than 0.8 nm.

It further differs in that it claims a **composite film** (= claim 17 of the application) comprising a heat-stabilised, heat-set, oriented polyester substrate and a coating layer, wherein the coating layer is derived from the coating composition and wherein the surface of said coated substrate exhibits an Ra value of less than 0.6 nm, and/or an Rq value of less than 0.8 nm.

Hence, the subject-matter of claims 1-26 is novel over D1.

2. The present application meets also the requirements of Article 33(3) PCT because the subject-matter of claim 1 to 26 is inventive.

As mentioned under item 1, the present application differs from D1 in that it does

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No.: PCT/GB03/01170

not disclose a composite film, nor the use of a coating composition to produce one, which exhibits an Ra value of less than 0.6 nm, and/or an Rq value of less than 0.8 nm.

In D1 and the prior art no indication is given to use the claimed coating compositions to arrive at the claimed composite film fulfilling the defined parameters.

Therefore the presence of an inventive step can be acknowledged for the subject-matter of claims 1-26 vis-à-vis the document D1.

3. The subject-matter of claims 1-26 is industrial applicable and therefore the present application also meets the requirements of Article 33(4) PCT.

CLAIMS

1. The use of a coating composition comprising:
 - (a) from about 5 to about 50 weight percent solids, the solids comprising from
5 about 10 to about 70 weight percent silica and from about 90 to about 30 weight percent of a partially polymerized organic silanol of the general formula $\text{RSi}(\text{OH})_3$, wherein R is selected from methyl and up to about 40% of a group selected from the group consisting of vinyl, phenyl, gamma-glycidoxypentyl, and gamma-methacryloxypropyl, and
 - 10 (b) from about 95 to about 50 weight percent solvent, the solvent comprising from about 10 to about 90 weight percent water and from about 90 to about 10 weight percent lower aliphatic alcohol,
wherein the coating composition has a pH of from about 3.0 to about 8.0,
for the purpose of improving the surface smoothness of a polymeric substrate,
15 wherein the surface of said coated substrate exhibits an Ra value of less than 0.6 nm, and/or an Rq value of less than 0.8 nm.
2. A use according to claim 1 wherein the pH of the coating composition is in the
20 range 3.0 to 6.5.
3. A use according to claim 1 wherein the pH of the coating composition is about 6.0.
4. A use according to any preceding claim wherein said substrate is a polyester film.
- 25 5. The use of claim 4 wherein said substrate is a poly(ethylene naphthalate) or poly(ethylene terephthalate) film.
6. The use according to claim 4 wherein the polyester is derived from 2,6-naphthalenedicarboxylic acid.
- 30 7. A use according to claim 6 wherein the poly(ethylene naphthalate) has an intrinsic viscosity of 0.5 – 1.5.

8. The use of any of claims 1 to 7 wherein said substrate is a heat-stabilised, heat-set, oriented film.

5 9. The use of any preceding claim wherein said substrate has a shrinkage at 30 mins at 230°C of less than 1%.

10 10. The use of any preceding claim wherein said substrate has a residual dimensional change ΔL_r measured at 25°C before and after heating the film from 8°C to 200°C and then cooling to 8°C, of less than 0.75% of the original dimension.

11. The use of any preceding claim wherein said substrate is a heat-stabilised, heat-set, oriented film comprising poly(ethylene naphthalate) film having a coefficient of linear thermal expansion (CLTE) within the temperature range from -40 °C to +100 °C of less than $40 \times 10^{-6}/^{\circ}\text{C}$.

15 12. A use according to any preceding claim wherein said heat-stabilised film has a % of scattered visible light (haze) of <1.5%.

20 13. A use according to any preceding claim wherein said heat-stabilised film is biaxially oriented.

25 14. A use according to any preceding claim in the manufacture of an electronic or opto-electronic device containing a conjugated conductive polymer and comprising said substrate.

15. A use according to claim 14 wherein said device is an electroluminescent display device.

30 16. A use according to claim 14 wherein said device is an organic light emitting display (OLED) device.

17. A composite film comprising a heat-stabilised, heat-set, oriented polyester substrate and a coating layer, wherein the coating layer is derived from the coating

composition recited in any of claims 1 to 3, and wherein the surface of said coated substrate exhibits an Ra value of less than 0.6 nm, and/or an Rq value of less than 0.8 nm.

5 18. A composite film according to claim 17 wherein said polyester is a poly(ethylene naphthalate) film.

19. A composite film according to claim 17 or 18 wherein said substrate exhibits one or more of the following characteristics:

10 (i) a shrinkage at 30 mins at 230°C of less than 1%; and/or

(ii) a residual dimensional change ΔL_r measured at 25°C before and after heating the film from 8°C to 200°C and then cooling to 8°C, of less than 0.75% of the original dimension; and/or

15 (iii) a coefficient of linear thermal expansion (CLTE) within the temperature range from -40 °C to +100 °C of less than $40 \times 10^{-6}/^{\circ}\text{C}$; and/or

(iv) a % of scattered visible light (haze) of <1.5%.

20. A composite film comprising a heat-stabilised, heat-set, oriented poly(ethylene naphthalate) substrate, and a coating layer; wherein said substrate exhibits one or more of:

20 (i) a shrinkage at 30 mins at 230°C of less than 1%; and/or

(ii) a residual dimensional change ΔL_r measured at 25°C before and after heating the film from 8°C to 200°C and then cooling to 8°C, of less than 0.75% of the original dimension; and/or

25 (iii) a coefficient of linear thermal expansion (CLTE) within the temperature range from -40 °C to +100 °C of less than $40 \times 10^{-6}/^{\circ}\text{C}$;

and wherein the surface of said coated substrate exhibits an Ra value of less than 0.6 nm, and/or an Rq value of less than 0.8 nm.

30 21. A composite film according to any of claims 17 to 20 further comprising a barrier layer.

22. A composite film according to claim 21 which exhibits a water vapour transmission rate of less than 10^{-6} g/m²/day and/or an oxygen transmission rate of less than 10^{-5} mL/m²/day.
- 5 23. A method of manufacture of a coated polymeric film which comprises the steps of:
(i) forming a substrate layer comprising poly(ethylene naphthalate);
(ii) stretching the layer in at least one direction;
(iii) heat-setting under dimensional restraint at a tension in the range of about 19 to
10 about 75 kg/m of film width, at a temperature above the glass transition temperature of the polyester but below the melting temperature thereof;
(iv) heat-stabilising under a tension of less than 5 kg/m of film width, and at a temperature above the glass transition temperature of the polyester but below the melting temperature thereof; and
(v) applying a planarising coating composition thereto such that the surface of said
15 coated substrate exhibits an Ra value of less than 0.6 nm, and/or an Rq value of less than 0.8 nm.
24. A method of manufacture of an electronic or opto-electronic device containing a conjugated conductive polymer and a substrate as described herein, said method
20 comprising the steps of:
(i) forming a substrate layer comprising poly(ethylene naphthalate);
(ii) stretching the layer in at least one direction;
(iii) heat-setting under dimensional restraint at a tension in the range of about 19 to
25 about 75 kg/m of film width, at a temperature above the glass transition temperature of the polyester but below the melting temperature thereof;
(iv) heat-stabilising under a tension of less than 5 kg/m, and at a temperature above the glass transition temperature of the polyester but below the melting temperature thereof;
(v) applying a planarising coating composition thereto such that the surface of said
30 coated substrate exhibits an Ra value of less than 0.6 nm, and/or an Rq value of less than 0.8 nm; and
(vi) providing the coated, heat-stabilised, heat-set, oriented film as a substrate in the device.

25. A method according to claim 24 further comprising providing on a surface of the coated substrate a barrier layer.
- 5 26. A method according to claim 25 wherein the composite film comprising said coated substrate and barrier layer exhibits a water vapour transmission rate of less than 10^{-6} g/m²/day and/or an oxygen transmission rate of less than 10^{-5} mL/m²/day.